

Claims:

1. A catalyst composition for the oxidation of ethane and/or ethylene to acetic acid, which composition comprises in combination with oxygen the elements molybdenum, vanadium, niobium and gold in the absence of palladium according to the empirical formula : $\text{Mo}_a\text{W}_b\text{Au}_c\text{V}_d\text{Nb}_e\text{Y}_f$ (I),

5 wherein Y is one or more elements selected from the group consisting of : Cr, Mn, Ta, Ti, B, Al, Ga, In, Pt, Zn, Cd, Bi, Ce, Co, Rh, Ir, Cu, Ag, Fe, Ru, Os, K, Rb, Cs, Mg, Ca, Sr, Ba, Zr, Hf, Ni, P, Pb, Sb, Si, Sn, Tl, U, Re, Te and La; and

a, b, c, d, e and f represent the gram atom ratios of the elements such that :

$$0 < a \leq 1; 0 \leq b < 1 \text{ and } a + b = 1;$$

10 $10^{-5} < c \leq 0.02;$

$$0.4 \leq d \leq 0.865; 0.135 \leq e \leq 0.23; \text{ and } 0.55 \leq d + e \leq 1; \text{ and}$$

$$0 \leq f \leq 2.$$

2. A catalyst composition as claimed in claim 1, selected from the group consisting of : $\text{Mo}_a\text{W}_b\text{Au}_c\text{V}_d\text{Nb}_e\text{Y}_f$, $\text{Mo}_a\text{Au}_c\text{V}_d\text{Nb}_e\text{Y}_f$, $\text{Mo}_a\text{W}_b\text{Au}_c\text{V}_d\text{Nb}_e$ and $\text{Mo}_a\text{Au}_c\text{V}_d\text{Nb}_e$.

15 3. A catalyst composition as claimed in claim 1 or claim 2, wherein $a > 0.01$, $0.0001 < c \leq 0.002$, $0.425 \leq d \leq 0.8$, $0.14 \leq e \leq 0.20$, $0.6 \leq d + e \leq 0.95$, and $f \leq 0.2$.

4. A catalyst composition as claimed in claim 3, wherein $0.0005 < c \leq 0.001$, $0.45 \leq d \leq 0.7$, $e \geq 0.15$, $d + e \leq 0.9$, and $f \leq 0.02$.

5. A catalyst composition as claimed in claim 4, wherein $d \geq 0.5$, $e \leq 0.18$, and $d +$
20 $e \geq 0.7$.

6. A catalyst composition as claimed in claim 5, wherein $d + e \geq 0.8$.

7. A catalyst composition as claimed in any one of the preceding claims, wherein $a = 1$.

8. A catalyst composition as claimed in any one of the preceding claims, wherein Y is selected from the group consisting of Sn, Sb, Cu, Pt, Ag, Fe and Re.

9. A catalyst composition as claimed in claim 1 having the formula selected from the group consisting of: $\text{Mo}_{1.00}\text{V}_{0.455}\text{Nb}_{0.200}\text{Au}_{0.0008}\text{O}_y$; $\text{Mo}_{1.00}\text{V}_{0.547}\text{Nb}_{0.163}\text{Au}_{0.0009}\text{O}_y$ and $\text{Mo}_{1.000}\text{V}_{0.661}\text{Nb}_{0.174}\text{Au}_{0.0009}\text{O}_y$ wherein y is a number which satisfies the valencies of the elements in the composition for oxygen.

10. A process for the selective production of acetic acid from a gaseous mixture comprising ethane and/or ethylene which process comprises contacting the gaseous mixture with a molecular oxygen-containing gas at elevated temperature in the presence of a catalyst composition as claimed in any one of the preceding claims.

11. A process as claimed in claim 10 in which the catalyst is used in the form of a fluidized bed.